

WHAT IS CLAIMED IS:

Sub A2

1. A surveying pole for use in locating a position in a survey of land, the surveying pole comprising at least one pole section, a point mounted on a lower end of said one pole section for engaging the ground, and a shoe sized and shaped for covering the point, the shoe being formed for releasable connection of the shoe to the surveying pole over the point to selectively cover the point whereby the surveying pole is capable of selective configuration for use in terrain having different surface properties without removal of the point.

Sub C1 cont.

2. A surveying pole as set forth in claim 1 wherein the point is formed for releasable connection of the shoe thereto.

3. A surveying pole as set forth in claim 2 wherein the point and shoe each have threads formed thereon which are interengageable for connecting the shoe to the point in a position substantially covering the point.

4. A surveying pole as set forth in claim 2 wherein the shoe is made of a polymeric material.

5. A surveying pole as set forth in claim 3 wherein the surveying pole has threads formed thereon remotely from the point and adapted to engage the threads of the shoe for stowing the shoe on the surveying pole.

Sub A3

6. A surveying pole as set forth in claim 1 wherein the shoe includes a substantially flat bottom having a surface area sized for engaging soft terrain to support the surveying pole above the terrain.

Sub C1 cont.

7. A surveying pole as set forth in claim 1 wherein the surveying pole is adapted for stowing the shoe at a location away from the point when the shoe is not needed.

8. A surveying pole as set forth in claim 1 wherein the shoe and surveying pole are formed for releasable interconnection at said location away from the point.

5 9. A surveying pole as set forth in claim 8 further comprising a level vial holder mounted on the surveying pole and capable of indicating that the pole is in a vertical orientation, the level vial holder having a first connection element formed thereon, the shoe having a second connection element formed thereon for engaging the first

connection element of the holder to releasably secure the shoe on the holder for stowing the shoe.

10. A surveying pole as set forth in claim 1 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, a lock for locking the second pole section in a fixed position of extension from the first pole section, the lock comprising a base mounted on the first pole section, a movable clamping jaw supported by the base, and an actuator for use in moving the jaw between a locked position in engagement with the second pole section and an unlocked position spaced from the second pole section, the movable clamping jaw comprising a rigid jaw member and an elastomeric pad mounted on the jaw member, the elastomeric pad including an engagement surface positioned for engaging the second pole section in the locked position of the lock, at least one of the elastomeric pad and the jaw member being shaped to provide frictional resistance to relative telescoping movement between the first and second pole sections in the locked position which increases upon application of force tending to induce such relative telescoping movement.

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11. A surveying pole as set forth in claim 1 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, the second pole section being adapted for releasable, snap-together connection with the first pole section.

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dict 1/25/2000

12. A surveying pole as set forth in claim 1 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, the second pole section fitting in a sealing sliding relation into the first pole section and the first and second pole sections being closed at their ends, at least one of the first and second pole sections being formed with an air escape orifice therein to control the rate of flow of air out of the pole when the second pole section is retracted into the first pole section for cushioning the retraction of the second pole section.

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13. A surveying pole as set forth in claim 1 further comprising a fitting received in and substantially closing an end of said one pole section, the fitting including first and second spaced circumferential engagement surfaces in contact with the interior of said one pole section for precisely locating the fitting relative to said one pole section and a circumferential channel located between the engagement surfaces, the channel being spaced from said one pole section, and an adhesive located in the channel and bonding the fitting to said one pole section.

14. A surveying pole as set forth in claim 1 further comprising a fitting received in and substantially closing an end of said one pole section, the fitting including an axially facing surface having a surface area and facing axially outward from said one pole section, the axially facing surface including a peripheral engagement portion constituting a first smaller portion of the axially facing surface area, and an axially recessed portion constituting a second larger portion of the surface area recessed axially from the peripheral engagement portion.

15. A surveying pole as set forth in claim 1 further comprising a level vial holder mounted on said one pole section, the level vial holder comprising first and second holder members engageable with said one pole section on generally opposite sides thereof, and adapted to be interconnected for clamping engagement with said one pole section, the first and second holder members having respective engagement surfaces

10 shaped at least partially in correspondence with the shape of an exterior surface of said one pole section, the first holder member including the engagement surface being formed of a rigid material for positively locating the level vial holder relative to said one pole section, the second holder member having an elastomeric pad on its engagement surface for enhancing frictional resistance to movement of the level vial holder axially of the surveying pole.

16. A surveying pole as set forth in claim 1 wherein the point is adapted for releasable mounting on a lower end of the first pole section, the point comprising a body, a tip formed for releasable interconnection with the body, and a spare tip formed for releasable interconnection with the body, the body having a cavity therein sized and shaped to hold the spare tip when not in use.

17. A surveying pole for use in locating a position in a survey of land, the surveying pole comprising at least one pole section, a point adapted for mounting on a lower end of said one pole section for engaging the ground, and a shoe formed for releasable connection to the surveying pole at the lower end to selectively configure the surveying pole for use in terrain having different surface properties, the surveying pole being adapted for stowing the shoe at a location away from the lower end of said one pole section when the shoe is not needed.

18. A surveying pole as set forth in claim 17 wherein the shoe and surveying pole are formed for releasable interconnection at said location away from the point.

19. A surveying pole as set forth in claim 17 further comprising a level vial holder mounted on the surveying pole and capable of indicating that the pole is in a vertical orientation, the level vial holder having a first connection element formed thereon, the shoe having a second connection element formed thereon for engaging the first connection element of the holder to releasably secure the shoe on the holder for stowing the shoe.

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20. A surveying pole as set forth in claim 17 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, a lock for locking the second pole section in a fixed position of extension from the first pole section, the lock comprising a base mounted on the first pole section, a movable clamping jaw supported by the base, and an actuator for use in moving the jaw between a locked position in engagement with the second pole section and an unlocked position spaced from the second pole section, the movable clamping jaw comprising a rigid jaw member and an elastomeric pad mounted on the jaw member, the elastomeric pad including an engagement surface positioned for engaging the second pole section in the locked position of the lock, at least one of the elastomeric pad and the jaw member being shaped to provide frictional resistance to relative telescoping movement between the first and second pole sections in the locked position which increases upon application of force tending to induce such relative telescoping movement.

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Ref. 78

21. A surveying pole as set forth in claim 17 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, the second pole section being adapted for releasable, snap-together connection with the first pole section.

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Ref. 78

22. A surveying pole as set forth in claim 17 wherein said one pole section constitutes a first pole section, the surveying pole further comprising a second pole section telescopingly received in the first pole section for extension and retraction relative to the first section, the second pole section fitting in a sealing sliding relation into the first pole section and the first and second pole sections being closed at their ends, at least one of the first and second pole sections being formed with an air escape orifice therein to control the rate of flow of air out of the pole when the second pole section is retracted into the first pole section for cushioning the retraction of the second pole section.

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23. A surveying pole as set forth in claim 17 further comprising a fitting received in and substantially closing an end said one pole section, the fitting including first and second spaced circumferential engagement surfaces in contact with the interior of said one pole section for precisely locating the fitting relative to said one pole section and a circumferential channel located between the engagement surfaces, the channel being spaced from said one pole section, and an adhesive located in the channel and bonding the fitting to said one pole section.

24. A surveying pole as set forth in claim 17 further comprising a fitting received in and substantially closing an end of said one pole section, the fitting including an axially facing surface having a surface area and facing axially outward from said one pole section, the axially facing surface including a peripheral engagement portion constituting a first smaller portion of the axially facing surface area, and an axially recessed portion constituting a second larger portion of the surface area recessed axially from the peripheral engagement portion.

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25. A surveying pole as set forth in claim 17 further comprising a level vial holder mounted on said one pole section, the level vial holder comprising first and second holder members engageable with said one pole section on generally opposite sides thereof, and adapted to be interconnected for clamping engagement with said one pole section, the first and second holder members having respective engagement surfaces shaped at least partially in correspondence with the shape of an exterior surface of said one pole section, the first holder member including the engagement surface being formed of a rigid material for positively locating the level vial holder relative to said one pole section, the second holder member having an elastomeric pad on its engagement surface for enhancing frictional resistance to movement of the level vial holder axially of the surveying pole.

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26. A surveying pole as set forth in claim 17 further comprising a point adapted for releasable mounting on a lower end of said one pole section, the point comprising a body, a tip formed for releasable interconnection with the body, and a spare

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tip formed for releasable interconnection with the body, the body having a cavity therein sized and shaped to hold the spare tip when not in use.

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Surf A 10
27. A level vial holder for holding a level vial capable of indicating orientation of an object, the level vial holder being adapted for mounting on the object, the level vial holder comprising first and second holder members engageable with the object on generally opposite sides thereof, and adapted to be interconnected for clamping engagement with the object, the first and second holder members having respective engagement surfaces shaped at least partially in correspondence with the shape of an exterior surface of the object, the first holder member including the engagement surface being formed of a rigid material for positively locating the level vial holder relative to the first pole section, the second holder member having an elastomeric pad on its engagement surface for enhancing frictional resistance to movement of the level vial holder axially of the surveying pole.

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28. A level vial holder as set forth in claim 27 wherein the first holder member has a compartment sized and shaped for receiving the level vial, and wherein the level vial holder further comprises a cover for the compartment, a generally circular elastomeric support adapted for reception in the compartment under the level vial and at least one fastener for connecting the cover to the first holder member, the fastener being adapted to adjust the orientation of the level vial within the compartment by tightening or loosening the fastener, the elastomeric support permitting the level vial to pivot within the compartment to different orientations.

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Surf A 10
29. A level vial holder as set forth in claim 27 in combination with a surveying pole on which the level vial holder is mounted, the surveying pole have a lower end and a shoe adapted for releasable connection to the lower end, and wherein one of the first and second holder members is formed with a connector element thereon adapted to connect the shoe for stowing the shoe when not in use.

dict cont

30. A level vial holder in combination with a surveying pole as set forth in claim 29 wherein the surveying pole further comprises a point adapted for connection to the lower end of the surveying pole, the point and shoe being constructed for releasable connection in a configuration in which the shoe covers the point.

See all

31. A surveying pole for use in locating a position in a survey of land, the surveying pole comprising at least one pole section, a point adapted for releasable mounting on a lower end of the pole section for use in locating the surveying pole on the ground, the point comprising a body, a tip formed for releasable interconnection with the body, and a spare tip formed for releasable interconnection with the body, the body having

5 a cavity therein sized and shaped to hold the spare tip when not in use.

32. A surveying pole as set forth in claim 31 further comprising a shoe configured for distribution of the weight of the surveying pole, the point and shoe being constructed for releasable connection in a configuration in which the shoe covers the point.

33. A surveying pole as set forth in claim 32 further comprising a connector element on the surveying pole remote from the point, the connector element being adapted to connect the shoe for stowing the shoe when not in use.

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